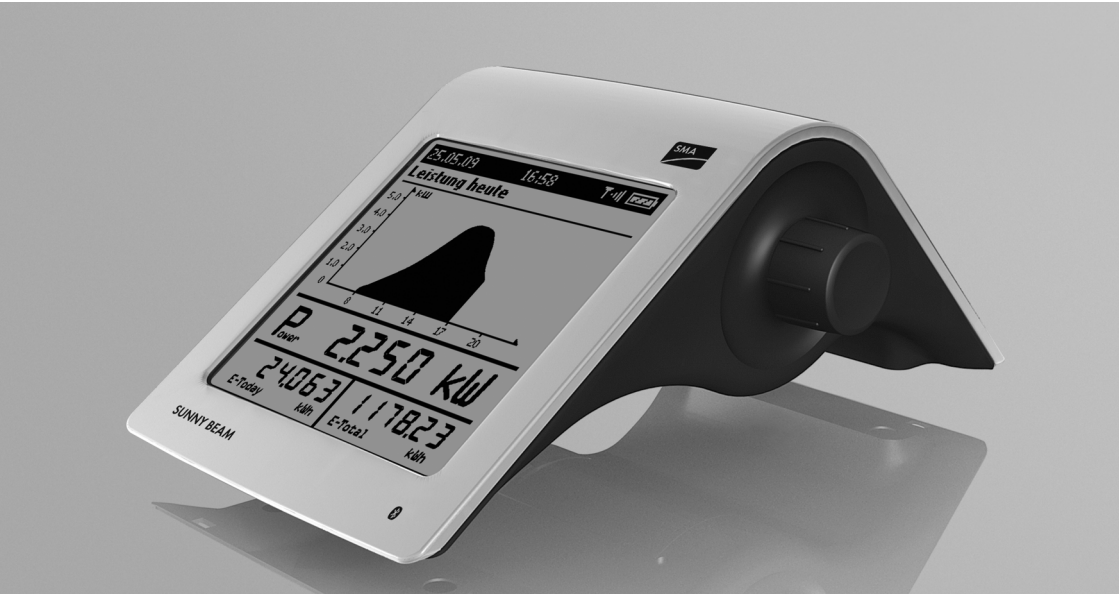
Solar Data Technology

SUNNY BEAM with Bluetooth® Wireless Technology

User Manual



SBeamBT-BUS092710 | 98-0013510 | Version 1.0

US

SMA America, Incorporated

4031 Alvis Court

Rocklin, California 95677-4011

Tel 916.625.0870

Fax 916.625.0871

www.SMA-America.com

IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS

This manual contains important instructions for the SMA *Bluetooth*® Piggy-Back - system monitoring unit, that shall be followed during installation and maintenance of the unit.

The SMA *Bluetooth* Piggy-Back is designed and tested according to international safety requirements, but as with all electrical and electronic equipment, certain precautions must be observed when installing and/or operating the SMA *Bluetooth* Piggy-Back. To reduce the risk of personal injury and to ensure the safe installation and operation of the SMA *Bluetooth* Piggy-Back, you must carefully read and follow all instructions, cautions and warnings in this Installation Guide.

Warnings

A Warning describes a hazard to equipment or personnel. It calls attention to a procedure or practice, which, if not correctly performed or adhered to, could result in damage to or destruction of part or all of the SMA equipment and/or other equipment connected to the SMA equipment or personal injury.

DANGER!

DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING!

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION!

CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE!

NOTICE indicates a situation that can result in property damage if not avoided.

Other Symbols

In addition to the safety and hazard symbols described on the previous pages, the following symbol is also used in this Installation Guide:

Information

This symbol accompanies notes that call attention to supplementary information that you should know and use to ensure optimal operation of the system.

General Warnings

General Warnings

All electrical installations must be done in accordance with the local and National Electrical Code ANSI/NFPA 70.

Before installing or using the SMA *Bluetooth* Piggy-Back, read all of the instructions, cautions, and warnings on the SMA *Bluetooth* Piggy-Back and the inverter, in this Installation Guide and the manual of the inverter.

Warranty

The currect guarantee conditions are available at www.SMA-America.com and can be downloaded or are available on paper from the usual sales channels if required. For warranty coverage, or if you have questions about the SMA *Bluetooth* Piggy-Back warranty, contact SMA America at the address, telephone number or Web site listed on page 3 (to send an E-mail, see the Contact section of the SMA America Web site).

Table of Contents

1 Notes on this Manual

1.1 Area of Validity

This manual is valid for the Sunny Beam firmware version 1.0 and later.

This manual does not contain any detailed information about the connected products. Detailed information about the products connected can be found in the user manual of the devices.

1.2 Additional Information

You can find further information on the following subjects in the 'Downloads' area of www.SMA-America.com.

- SMA *Bluetooth*® Wireless Technology
- CO_2 factor

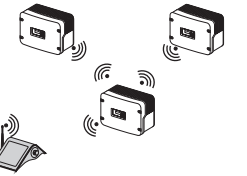
1.3 Terminology

This user manual uses the terminology indicated in the following table.

Type	Example of terminology
Main menu item	Select "Settings".
Submenu item	Select "Settings > Date".

2 Sunny Beam with *Bluetooth*

2.1 Field of application



Sunny Beam is a communication device which requests, displays and saves data from up to 12 inverters in a *Bluetooth* PV plant. Communication with the inverters takes place via *Bluetooth*® Wireless Technology. The transmitting power corresponds to *Bluetooth* Class 1.

Sunny Beam only supports inverters from SMA Solar Technology that are fitted with *Bluetooth*. Most SMA Solar Technology inverters that do not have integrated *Bluetooth* can be retrofitted with the SMA *Bluetooth* Piggy-Back.

2.2 Functions

- Processing data from up to 12 inverters
- Connection to the inverters via *Bluetooth*
- Range of up to 330 ft. in the open space with direct visual contact
- Supports inverters with *Bluetooth* from SMA Solar Technology:
  - Inverters with integrated SMA *Bluetooth* with software package 2.06 and later
  - Inverters with integrated SMA *Bluetooth* Piggy-Back
- Display of faults and warnings on the integrated display
- Acoustic alarms to indicate faults in the PV plant
- Connection to the computer via the USB connection cable (max. 9.8 ft. cable length)

- Saves the system data in CSV format for at least 100 days as well as up to 25 faults and warnings. The storage volume depends on the number of inverters. If the memory is full, the old system data will be overwritten.
- Graphical display of the following data for the complete PV system and for each inverter on the integrated display:
  - Performance today / Performance yesterday
  - Energy for the last 31 days / Energy for the last 12 months
  - Specific annual yield
  - Allowance for the current day and total allowance so far
  - CO_2 emissions avoided for the present day and total present CO_2 emissions avoided.
- Display of the following values for the entire system and for individual inverters:
  - Present AC power
  - Daily yield (E-Today)
  - Energy yield yesterday (E-Yday) when calling up the chart "Power yesterday"
  - Total energy yield (E-Total)

3 Safety

3.1 Appropriate Usage

Sunny Beam is only suitable for indoor use. The ambient temperature must be between 32 °F and +104 °F. The power supply for Sunny Beam may only be provided by rechargeable nickel-metal hydride batteries (NiMH), type Mignon (AA) with low self-discharge, e.g. Eneloop batteries.

Sunny Beam is only suitable for use with original accessories from SMA Solar Technology or accessories recommended by SMA Solar Technology.

The Sunny Beam data must not be used for billing purposes.

Data collected by Sunny Beam regarding the power generated by your PV plant may deviate from the electricity meter.

3.2 Safety Instructions

Please follow all operating and safety precautions in this manual. Failure to follow these instructions may result in damage to the device and risk of personal injuries.

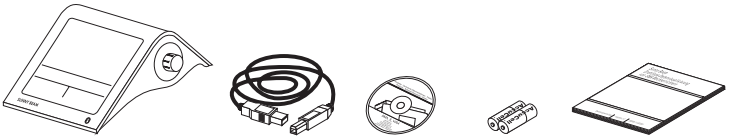
Notice!

Damage to Sunny Beam caused by leaking batteries. Batteries of the wrong type may leak into the Sunny Beam and damage the device.

- You must only use rechargeable nickel-metal hydride batteries (NiMH), type Mignon (AA) with low self-discharge, e.g. Eneloop batteries (see section 13 "Accessories" (page 79)).

4 Unpacking

4.1 Packing List



A B C D E

Position	Quantity	Name
A	1	Sunny Beam with *Bluetooth*
B	1	USB connection cable for connection to the computer
C	1	Software DVD
D	2	Nickel-metal hydride batteries (NiMH), type Mignon (AA) with low self-discharge
E	1	Manual

4.2 Identifying the Sunny Beam

Type Plate

You can identify the Sunny Beam by the type plate. The type plate is located on the lower side of the Sunny Beam.

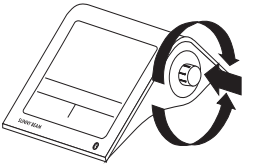
Firmware Version

You can check the firmware version of the Sunny Beam in the Menu "Service > Diagnostics > Device information > Sunny Beam".

5 Commissioning

5.1 Sunny Beam Controls

The Sunny Beam is operated using the push button that can be turned and pressed.



Moving the selection frame

The selection frame (see fig. on the right) indicates which menu item is currently selected. By turning the push button, you can move the selection frame to the next menu item or the previous menu item.

Selecting a menu item, setting values

When the selection frame is placed over a menu item, you may open the menu item by pressing the push button. When you have opened a menu item with a colon, you can set the values by turning the button.

Selecting a button

When the selection frame is placed over a button (see example in the fig. on the right), the button becomes dark. The selection frame is not displayed.

Navigating backwards in the menu

Using the arrow icon you can go backwards in the menu until the main menu is displayed. By selecting the house icon, you will go straight to the main menu.

5.2 Initial settings

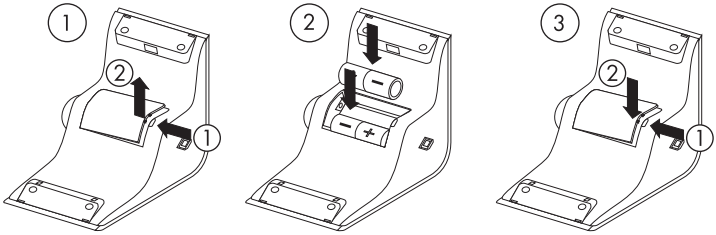
Commissioning of a Bluetooth PV plant with only 1 master at all times.

A *Bluetooth* PV plant must only be commissioned with 1 master (e.g. Sunny Beam with *Bluetooth,* Sunny Explorer). As soon as the *Bluetooth* network is up and running, you can integrate further masters into the *Bluetooth* network.

The first steps are described in detail, so that you can familiarize yourself with the controls of Sunny Beam.

Sunny Beam will guide you through the commissioning procedure. If a fault occurs during commissioning, you can restart commissioning by pressing the push button for about 10 seconds, until the SMA logo is displayed.

1. Open the battery compartment on the underside of the Sunny Beam.
2. Place the included batteries into the battery compartment of the Sunny Beam according to the indication.
3. Close the lid of the battery compartment.

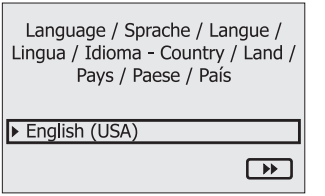


4. Press the button.

☑ The start screen appears.

5. Press the button.

☑ The page for setting the language appears. This page appears automatically after 10 seconds.

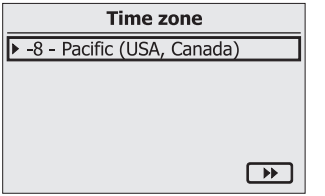


Setting the language and the country

6. If you want to change the selected language and country, press the button.
   ☑ The background of the selected language and country becomes dark.
7. Turn the button until the required language and country are displayed.
8. Press the button.
   ☑ No items remain dark. The language and country have ben set.
9. Move the selection frame to the button ">>" (next) by turning the button.

☑ The button ">>" (next) becomes dark.

10. Press the button.
    ☑ The page for setting the time zone appears.



Setting the time zone

Be sure to set the correct values for date, daylight saving time, time and time zone on the Sunny Beam. If you reset the time after commissioning, the data associated with the time difference will be deleted from the inverter. Please note that the time may also be reset if you change the settings for time zone or daylight saving time.

Confirming the time settings

Due to the extensive time management in your PV plant, the first attempt to change the time settings may not be successful, if, for example, the time has already been set using Sunny Explorer. Check the time settings again after commissioning and correct them, if required.

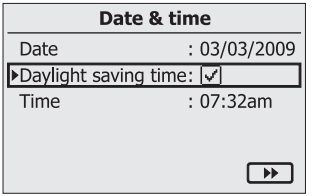
11. To change the time zone, press the button.
    ☑ The time zone will become dark.

12. Turn the button until the required time zone is displayed.
13. Press the button.

    ☑ No items remain dark. The time zone has been set.
14. Move the selection frame to the button ">>" (next) by turning the button.

    ☑ The button ">>" (next) becomes dark.
15. Press the button.

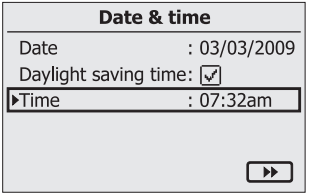
    ☑ The page for setting the date and time appears.



Setting the date

16. Press the button.

    ☑ The first adjustable digits become dark.

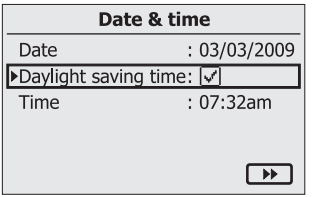


17. Turn the button until the required value is shown.
18. Press the button and repeat the steps until no digits are dark.

    To change incorrect values, press the push button until the value that you need to change becomes dark.

    ☑ The date has been set.

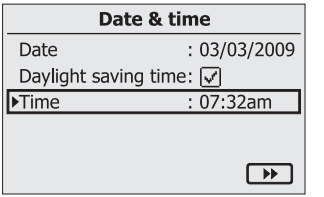
Activating daylight saving time



19. To activate daylight saving time, move the selection frame to "Daylight saving time:" by turning the button, then press the button to tick the box.

    ☑ Daylight saving time is activated.

Setting the time



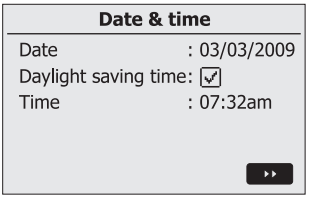
20. Move the selection frame to "Time" by turning the button.
21. Press the button.

    ☑ The first adjustable digits become dark.
22. Turn the button until the required value is shown.
23. Press the button and repeat the steps until no digits are dark.

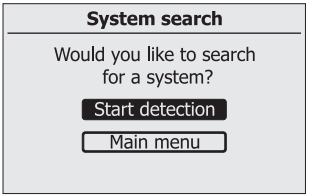
    The time will start counting again as soon as no digits in the menu item "Time" are dark.

    ☑ Time has been set.
24. Move the selection frame to the button ">>" by turning the button.

☑ The button becomes dark.



25. Press the button.
    ☑ The page for searching for systems appears.



Determining a free NetID

This section explains what a NetID is and how you determine a free NetID before commissioning your PV plant.

NetID

The NetID serves to distinguish PV plants with SMA *Bluetooth* in close proximity from one another. SMA Solar Technology *Bluetooth* devices recognize your *Bluetooth* PV plant via an assigned NetID.

The NetID can be a number from 2 to 9 or a letter from A to F. NetID 1 is not possible for Sunny Beam.

You can select one of the NetIDs for your *Bluetooth* PV plant, if this NetID is not already used by another PV plant with SMA *Bluetooth* in the vicinity.

To check whether there is another PV plant with SMA *Bluetooth* within the radio range of your device and which NetID it uses, carry out a system search with Sunny Beam on the installation site for each device of your *Bluetooth* PV plant.

Alternatively, you can also determine a free NetID using a laptop with *Bluetooth* and the program Sunny Explorer from SMA Solar Technology. For more information on how to do this, please refer to the Sunny Explorer Help. You can download the program Sunny Explorer from www.SMA-America.com free of charge.

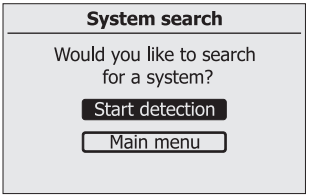
The following table lists the functions of the NetIDs. NetID 0 and NetID 1 have special functions. NetID 1 is the default setting for the inverters and the SMA *Bluetooth* Repeater when delivered. Sunny Beam cannot detect any devices with the NetID set to 1.

NetID	Function
0	*Bluetooth* is switched off.
1 (Condition upon delivery)	*Bluetooth* is switched on. The inverter or the SMA *Bluetooth* Repeater can only connect to a maximum of 2 computers with Sunny Explorer from SMA Solar Technology. A connection to the Sunny Beam is not possible.
2 - F	*Bluetooth* is switched on. The inverter or the SMA *Bluetooth* Repeater can interlink with all SMA *Bluetooth* products with the same NetID.

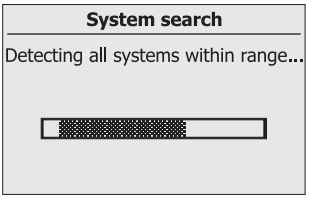
Initially leave the devices on the preset NetID 1. Start by determining a free NetID, as follows.

26. Place the Sunny Beam near a device of your *Bluetooth* PV plant.

27. To start the system search, the button "Start detection" must be dark. Press this button.



☑ The system search will begin.

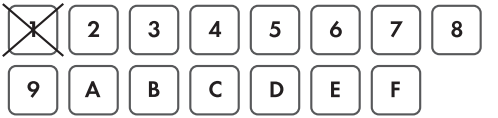


☑ The Sunny Beam detects all *Bluetooth* PV plants within range and lists the NetIDs of the detected *Bluetooth* PV plants. In the list, the NetIDs are sorted according to connection quality; the NetID with the best connection quality is placed at the top. The listed NetIDs are already in use on *Bluetooth* PV plants in the vicinity. You may not use these NetIDs.

– If the Sunny Beam does not list any NetIDs, there are no *Bluetooth* PV plants within the radio range of the Sunny Beam. All NetIDs are free.

28. Note down the NetIDs already in use, or cross them out in the following illustration.

29. Repeat the system search with the Sunny Beam for each device in the PV plant and at the desired installation site of the Sunny Beam itself. Note down the NetIDs already in use, or cross them out in the following illustration.



Sunny Beam cannot detect any devices with the NetID set to 1. Therefore, NetID 1 has already been crossed out in this illustration.

30. Once the system search has been carried out for all the devices, choose a NetID for your PV plant which was not displayed by the Sunny Beam.

    ☑ The free NetID is determined.

31. Set the free NetID on the inverters and available SMA *Bluetooth* Repeaters, as described in the respective manual.

32. Commission the inverters and available SMA *Bluetooth* Repeaters as described in the respective manual.

Search for your own *Bluetooth* PV plant

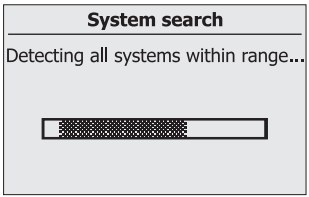
Do not start the Sunny Beam again until you have set the free NetID on the inverters and available SMA *Bluetooth* Repeaters and have commissioned these devices.

33. Set up the Sunny Beam at its intended installation site.

34. To search for your *Bluetooth* PV plants, choose "Repeat search".

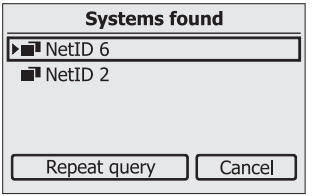
    You can also start the system search via the menu "Settings > PV plant > New plant search".

    ☑ The plant search will begin.



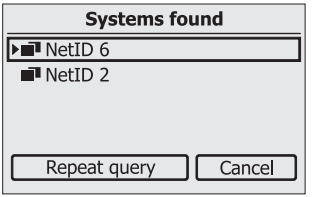
☑ The Sunny Beam detects all *Bluetooth* PV plants within range and lists the NetIDs of the detected *Bluetooth* PV plants.

– If the Sunny Beam does not list the NetID of your *Bluetooth* PV plant, please refer to section 11 "Troubleshooting" (page 72).



Setting the NetID for your own *Bluetooth* PV plant

35. Move the selection frame to the NetID of your own *Bluetooth* PV plant by turning the button.

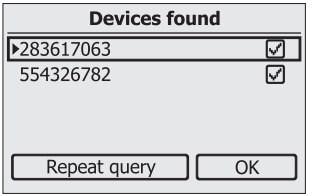


36. Press the button.

☑ The Sunny Beam will establish a connection to your *Bluetooth* PV plant.

☑ The Sunny Beam then lists the serial numbers of the detected inverters.

– If not all inverters of your *Bluetooth* PV plant are listed, or if inverters from other plants are listed, please refer to section 11 "Troubleshooting" (page 72).



Selecting the required inverters (only applies when more than 12 inverters are available)

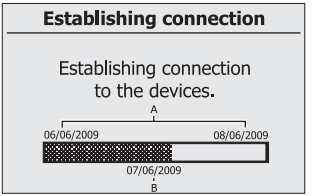
The Sunny Beam can only manage a maximum of 12 inverters. If your *Bluetooth* PV plant comprises more than 12 inverters, you must select the 12 inverters that you want the Sunny Beam to manage.

37. Press the button to select the inverters that are to be managed by the Sunny Beam.

☑	selected
☐	not selected

Establish connection to the devices

38. Move the selection frame to "OK" by turning the button.
    ☑ The field "OK" becomes dark.
39. Press the button.
    ☑ The Sunny Beam establishes the connection to the selected inverters and retrieves the data.



A	The start date and end date of the time period from which the Sunny Beam will retrieve data.
B	The date from which the Sunny Beam is retrieving data right now.

If it is the first time that a connection to your PV plant is established with the Sunny Beam, the Sunny Beam will retrieve all the data from the inverters, starting from the day before yesterday. If you are re-detecting a PV plant, the Sunny Beam will retrieve data from the days that have been saved in the inverter since the last retrieval.

☑ The Sunny Beam then lists the serial numbers of the connected inverters.

Inverters for which the system password is still the same as at delivery, are indicated by a check mark (✓).

Inverters for which another system password has been set are marked with a padlock (🔒) and must be released using the correct system password. Inverters that temporarily cannot establish a connection to the Sunny Beam are also marked with a padlock.

The Sunny Beam can only manage data from inverters for which the system password has been correctly entered in the Sunny Beam.

Changing the system password with Sunny Explorer

The system password protects your *Bluetooth* PV plant from unauthorized access to your device. All devices belonging to a *Bluetooth* PV plant must have the same system password.

The Sunny Beam can only manage data from inverters for which the system password has been correctly entered in the Sunny Beam. The system password can only be changed from a computer with *Bluetooth* and the program Sunny Explorer from SMA Solar Technology. You can download the program Sunny Explorer from www.SMA-America.com free of charge.

System password at delivery

At delivery the system password for users is 0000.

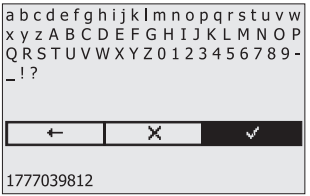
40. Change the system password for the inverters using the program Sunny Explorer, as described in the Sunny Explorer Help. Notify the system owner of the new system password for users.

Enter the new system password in the Sunny Beam

Forgotten password

If you have forgotten or lost your system password, please contact the SMA Serviceline (see section 14 "Contact" (page 80)).

41. Move the selection frame to "System password" by turning the button.
    ☑ The field "System password" becomes dark.
42. Press the button.
    ☑ The input page appears.



43. Enter the system password for users.

←	Arrow: deletes the character which was entered last.
✕	Cross: cancels the input action.
✓	Check mark: the system password is saved.

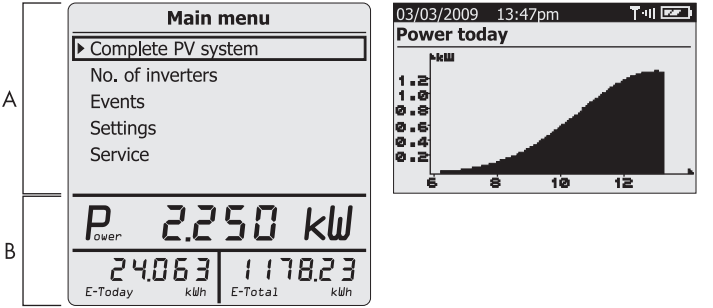
44. Select the check mark to save the entered system password.
    ☑ The list of connected devices is displayed.
45. Select "OK".
    ☑ The first chart for the complete PV system, "Power today", is displayed.

☑ The Sunny Beam is now in operation.

6 Operation

6.1 Display

The Sunny Beam display is divided into two sections. The top section contains the menu and chart view, the lower section contains the power and energy display.



A	Menu and chart view
B	Power and energy display

When the Sunny Beam attempts to establish a connection to the inverters in order to retrieve the current data, the hourglass appears in the middle of the display.

6.1.1 Switching on the display/calling up the main menu

Switching on the display/calling up the main menu

You can switch on the display by pressing or turning the button. The Sunny Beam opens the first chart, "Power today", in the chart view for the complete system. The chart view is described in section 6.3 "Chart view" (page 35).

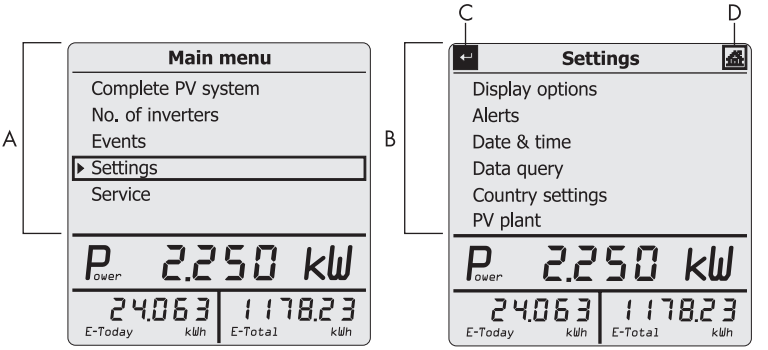
You can switch from the chart view to the main menu by pressing the button. After 3 minutes, the Sunny Beam will always switch from the menu to the chart "Power today" for the complete system automatically, unless the display switches off automatically first.

The display switches off automatically

To save energy the Sunny Beam will automatically switch off its display after being idle for 1 minute. You can change this duration as described in section 6.8.2 "Changing the display switch-off" (page 47).

6.2 Menu

Using the menu, you can change settings on the Sunny Beam and the call up information of your complete PV plant and about the individual inverters.



A	Main menu	
B	Submenu (example page)	
C		Arrow icon: go backwards in the menu.
D		House icon: go straight to the main menu.

An overview of the whole menu is depicted in section 8 "Menu overview" (page 67).

6.3 Chart view

The Sunny Beam can visualize the data for the complete system and for each individual inverter in charts. The following charts exist:

- Power today

  When the chart "Power today" is open, the Sunny Beam will continuously query the current power and total energy yield (E-Total) This query is called "Live query". You can set the duration for which the Sunny Beam should perform the live query. For more information refer to section 6.9.2 "Changing the live query duration" (page 49).
- Power yesterday
- Yield values of last 31 days
- Yield values of last 12 months
- Specific annual yield (only as chart view for complete PV system)
- Revenue
- CO_2 avoided

The Display "Power today" is only available once the inverter is active.

The current data for the day is not available until the inverter has switched itself on in the morning. The Sunny Beam will therefore display the data of the previous day in the chart "Power today" until all the inverters are switched on.

6.3.1 Calling up the chart "Complete PV system"

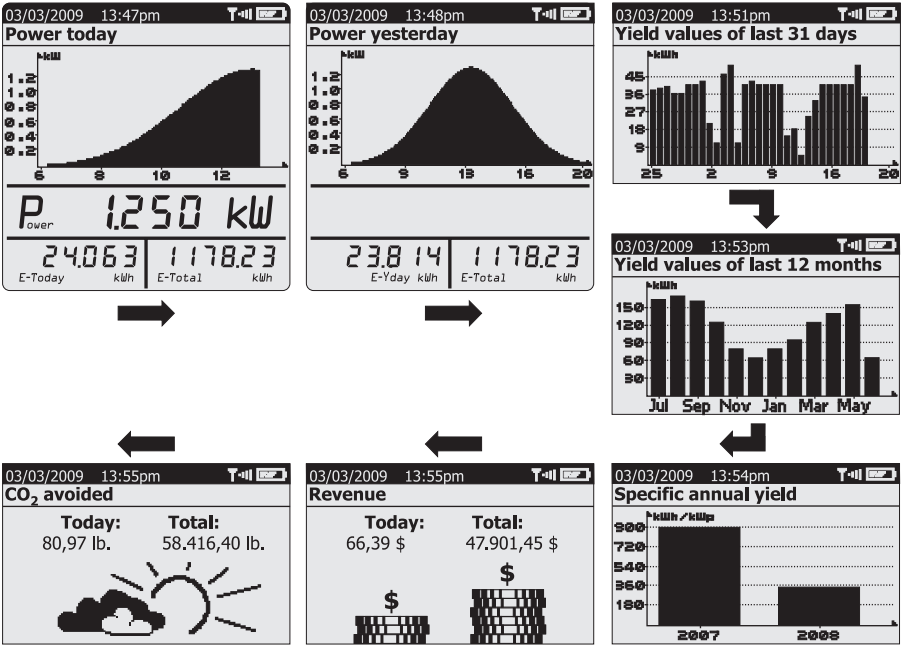
1. Select "Complete PV system" in the main menu.
   ☑ The first chart, "Power today", is displayed.
2. Turn the button to see the next chart for the complete system.

☑ The chart view for the complete system is displayed.

To return to the main menu, press the button.

Complete PV system

When you call up the chart "Power yesterday", the power and energy display will switch from "E-Today" (PV plant energy today) to "E-Yday" (PV plant energy yesterday).



6.3.2 Calling up the chart "No. of Inverters"

The Sunny Beam can visualize the data of each individual inverter graphically. How to call up the chart view for an inverter:

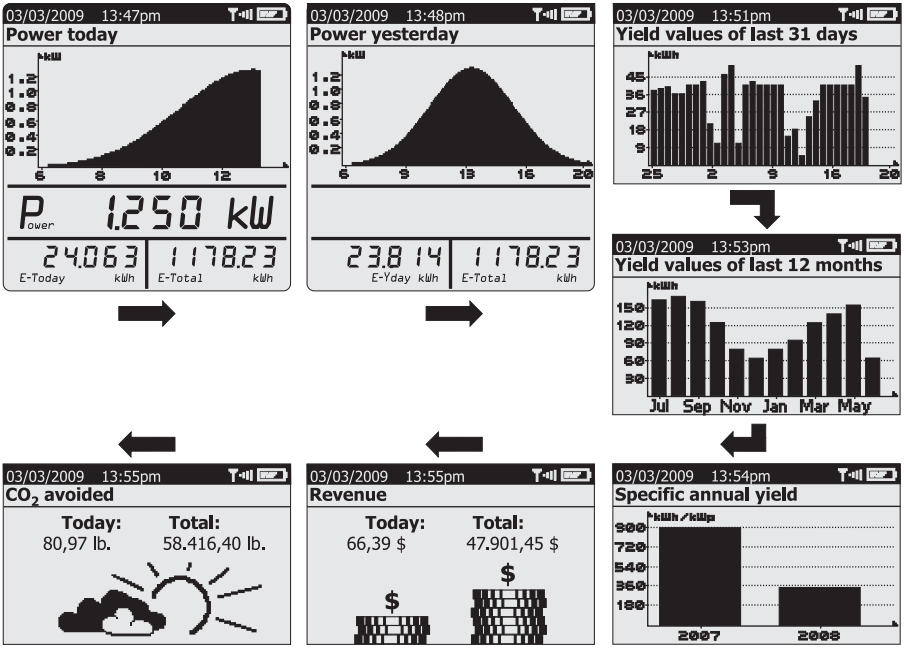
1. Select "No. of inverters" in the main menu.
   ☑ The list of inverters appears.
2. Select an inverter.
   ☑ The first chart, "Power today", is displayed.
3. Turn the button to view the next inverter chart.

☑ The chart view of an inverter is displayed.

To return to the menu, press the button.

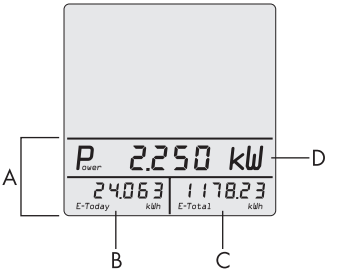
Individual inverters

When you call up the chart "Power yesterday", the power and energy display will switch from "E-Today" (PV plant energy today) to "E-Yday" (PV plant energy yesterday).



6.4 Power and energy display

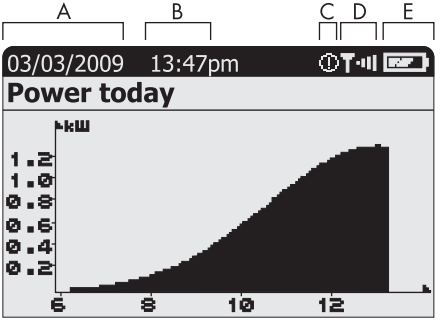
In the power and energy display you can view the energy and power values of your PV plant. The power and energy display is shown in the chart view while the Sunny Beam is retrieving data from the inverters (data query, live query) and for 60 seconds following the query. The power value is blanked out after 60 seconds, since the data is no longer valid. The power and energy display is never shown when the menu is open.



A	Power and energy display		
		data displayed in the chart view for the complete PV system:	data displayed in the chart view for individual inverters:
B	E-Today	PV plant energy today	Inverter energy today
	E-Yday	PV plant energy yesterday	Inverter energy yesterday
C	E-Total	Total energy yield of the PV plant	Total energy yield of the inverter
D	Power	Current AC power of the PV plant	Current AC power of the inverter

6.5 Symbols in the chart view

The chart view shows date, time and symbols. The symbols are explained in this section.

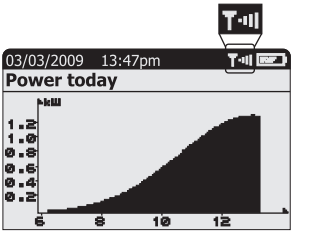


A	Date	Section 6.13
B	Time	
C	• Symbol for recent or unread warnings. • Symbol for recent or unread faults. • If there are no unread warnings or faults, no symbol will be displayed.	Section 6.5.3
D	Symbol for the connection quality	Section 6.5.1
E	Battery symbol which indicates the battery state of charge	Section 6.5.2

6.5.1 Symbol for the connection quality

The symbol for connection quality indicates whether the Sunny Beam is connected to a device in your PV plant and the quality of this connection.

When the Sunny Beam is establishing a connection, this is indicated by the following symbol: 

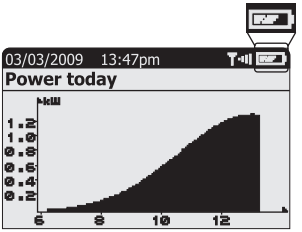


Symbol	Connection quality
	very good
	good
	Unreliable
	Critical
	None

A larger display of the connection quality and the serial number of the device via which the Sunny Beam is connected to the complete PV plant can be found in the menu "Service > Diagnosis > Connection quality" (section 6.10.1 "Checking the connection quality" (page 51)).

6.5.2 Battery symbol/Charging the batteries

The battery symbol indicates the state of charge of the Sunny Beam batteries. If the state of charge of the batteries is too low, a short acoustic signal will sound as soon as you use the Sunny Beam. In addition, a message will appear on the display.



Symbol	Meaning
	The battery is fully charged.
	The battery is no longer fully charged.
	The battery is empty.

If you are charging the batteries via the Sunny Beam USB connection, the Sunny Beam will visualize the charging process by displaying the battery symbols one after the other.

Charging the batteries when there is sufficient daylight

Put the Sunny Beam in a place with as much light as possible, ideally in direct sunlight, so that sufficient light hits the solar cell.

Charging the batteries when there is insufficient daylight

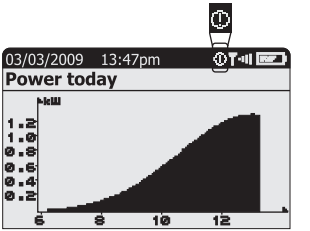
Connect the Sunny Beam to a USB port on the computer with the USB connection cable which is delivered with the Sunny Beam. If no computer is available, use the USB plug-in power supply. The USB plug-in power supply is not included in the scope of delivery (see section 13 "Accessories" (page 79)).

USB hubs

When using a USB hub to connect to the computer, only use self-powered USB hubs.

6.5.3 Fault and warning symbols

The Sunny Beam indicates faults or warnings relating to the devices by displaying the fault or warning symbol in the chart view.



You will find details on the fault or warning in the menu "Events" (see section 6.6 "Calling up events" (page 44)). As soon as you call up the menu "Events", the symbol will no longer be shown on the display.

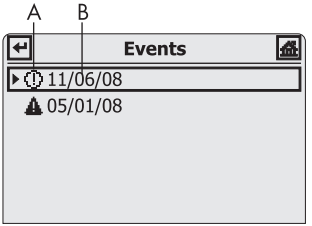
If there are no unread warnings or faults, no symbol is displayed.

Symbol	Meaning
Warning 	A fault may occur in the foreseeable future. The warning symbol is displayed if, for example, there is a frequent grid overvoltage. • The symbol appears in the display for the complete PV system and the inverters. • The warning is listed in the "Events" menu.
Fault 	A fault has occurred. The fault symbol is displayed if an inverter requires external help (from an installer) in order to function properly. • The symbol appears in the display for the complete PV system and the inverters. • The fault is listed in the "Events" menu. • An alarm sounds until the user turns or presses the button ().6.7.1 "Set / disable alarm for faults" (page 47)

6.6 Calling up events

The Events menu lists the 25 most recent events of the devices. If a warning or a fault has occurred, the Sunny Beam displays the fault or warning symbol in the chart view (see section 6.5.3 "Fault and warning symbols" (page 43)).

Information in the Events menu

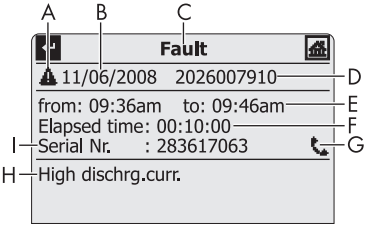


A	Event symbol (warning/fault)
B	Date of the event

1. Select "Events".
2. Select the event for which you wish to see detailed information.

☑ The details of the selected event are displayed.

Details of an event



A	Event symbol (warning/fault)
B	Date of the event
C	Event name (warning/fault)
D	Name or serial number of the device where the event occurred.
E	• Start time ("since"), if the event has not yet ended or the end time is not known. • Start time to end time ("from: to:"), if the event has ended. • End time ("to:"), if the event has ended and the start time is unknown.
F	• Duration of the event in hours : minutes : seconds • "–:–:–", if the event has not yet ended or the duration could not be calculated because the start time is unknown.
G	Symbol for faults. Contact your installer.
H	Event message
I	Serial number of the device where the event occurred.

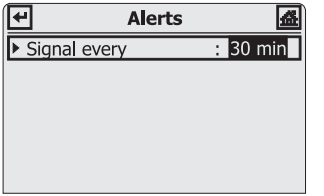
6.7 Sunny Beam alarms

The Sunny Beam has a buzzer which emits an alarm when a "Fault" event occurs or when the battery state is too low.

Alarm	Repetition	Meaning
1 long signal (lasts for 3 seconds)	Adjustable, see section 6.7.1)	The event "Fault" has occurred. (section 6.6).
1 short signal (lasts for half a second)	Every 10 minutes until the display switches itself off according to the duration that has been preset (section 6.8.2 "Changing the display switch-off" (page 47)).	The state of charge of the battery is too low. Charge the batteries as described in section 6.5.2 .
3 short signals in immediate sequence		The state of charge of the batteries is so low that reliable operation is impossible. The Sunny Beam is switched off. Charge the batteries as described in section 6.5.2

6.7.1 Set / disable alarm for faults

If the event "Fault" occurs, a 3 second long alarm will sound. The alarm is repeated after a certain interval set by the user until you press the button, however, not for more than 24 hours.



1. Select "Settings > Alerts".
2. Select "Signal every:".
3. Set the interval.

   The default setting is 30 minutes. To disable the alarm, select "- - -".

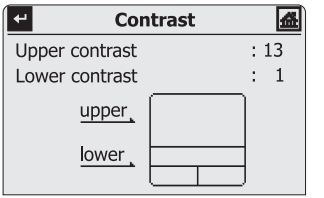
☑ The alarm for faults has been set.

6.8 Display settings

6.8.1 Changing the contrast

1. Select "Settings > Display options > Contrast".
2. Select "Upper contrast" or "Lower contrast".
3. Set the contrast.

☑ The contrast is changed.



6.8.2 Changing the display switch-off

To save energy the Sunny Beam will automatically switch off its display after being idle for 1 minute. You can adjust the duration or set the display to always remain switched on (Setting "-").

1. Select "Settings > Display options > Display off after:".
2. Set the interval.

☑ The switch-off has been set up.

Power consumption

The longer the display remains switched on, the higher the power consumption of the Sunny Beam.

6.8.3 Setting the coefficients of balance

The coefficients of balance are used to calculate revenue and CO_2 avoided.

Revenue / kWh

The coefficient used for calculating revenue is the earnings per kWh.

CO_2 / kWh

The coefficient used for calculating CO_2 avoided depends on the energy mix of the location where the PV plant is installed. You can find out how high the CO_2 factor of the location is by asking the power supplier.

You will find further information on the CO_2 factor in the download area of www.SMA.de.

1. Select "Settings > Display options > Coefficients of balance".
2. Select "Revenue / kWh:" or "CO2 / kWh:".
3. Set the coefficient.

☑ The coefficients of balance are now set.

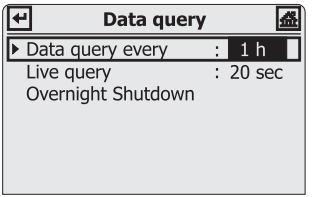
6.9 Data query

6.9.1 Changing the data query frequency

You can change the frequency at which the Sunny Beam is to query data from the inverters. The default setting is 1 hour.

1. Select "Settings > Data query > Data query every:".
2. Set frequency.

☑ The frequency for data queries has been changed.



Power consumption

The higher the data query frequency is, the more energy the Sunny Beam will consume. One query per day is usually sufficient, since the data is buffered in the inverter.

Overnight Shutdown for data queries preset

As the default setting, the Sunny Beam data query from inverters is shut down over night, because the solar inverters do not supply at night and therefore do not generate any data. If you are using a wind power inverter from SMA Solar Technology, you need to disable the Overnight Shutdown (section 6.9.3 "Disabling the Overnight Shutdown" (page 50)).

6.9.2 Changing the live query duration

The live query only begins if you call up the chart "Power today" for the complete PV system or for one of the inverters.

During the live query, the Sunny Beam reads the current values for power and total energy yield ("Power" and "E-Total" on the Sunny Beam power and energy display) at that precise moment. This way, you can see the current power live and, for example, observe the effect of a passing cloud on your PV plant.

The values for "E-Today" are not updated during the live query. This data is updated by Sunny Beam once per hour according to the default setting (section 6.9.1 "Changing the data query frequency" (page 49)).

You can change the duration of the live query. The default setting is 20 seconds.

1. Select "Settings > Data query > Live query:".
2. Set the interval.

☑ The duration of the live query has been changed.

Power consumption

The longer the duration of the Sunny Beam live query, the more power the Sunny Beam will consume.

6.9.3 Disabling the Overnight Shutdown

As the default setting, the Sunny Beam data query from inverters is shut down over night, because the inverters do not supply at night and therefore do not generate any data. Only disable the Overnight Shutdown if you are using a Windy Boy (wind power inverter from SMA Solar Technology).

1. Select "Settings > Data query > Overnight Shutdown".
2. Remove the check mark from the "active" box.

☑ The Overnight Shutdown is now disabled.

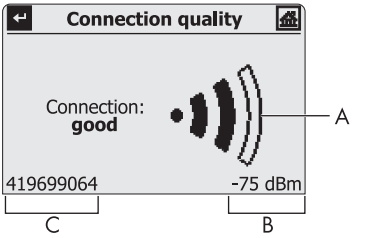
To prevent the batteries from discharging when the overnight shutdown is disabled, connect the Sunny Beam to the computer using the USB connection cable supplied with the Sunny Beam. The computer will supply the batteries with power. The computer needs to remain switched on.

Alternatively, you can connect the Sunny Beam to the USB plug-in power supply, which supplies the batteries with power via a socket. The USB plug-in power supply is not included in the scope of delivery. You can order the plug-in power supply as an accessory from SMA Solar Technology, see section 13 "Accessories" (page 79).

6.10 Service Functions

6.10.1 Checking the connection quality

In the menu "Service > Diagnosis > Connection quality", you can check the connection quality of the connection from the Sunny Beam to the device via which the Sunny Beam is connected to the complete PV plant.



A	The connection quality as a symbol
B	The connection quality in decibel, relating to 1 mW
C	Serial number of the device with SMA *Bluetooth*, to which the Sunny Beam is connected.

Very high power consumption

When the menu "Connection quality" is displayed, the Sunny Beam is continuously retrieving new data from the inverters and will not switch off automatically. The power consumption of the Sunny Beam is therefore very high.

Levels of connection quality

Symbol	Connection quality	Decibel in relation to 1 mW
	very good	more than -68 dBm
	good	-82 to -68 dBm
	Unreliable	-90 to -82 dBm
	Critical	-100 to -90 dBm
	None	less than -100 dBm

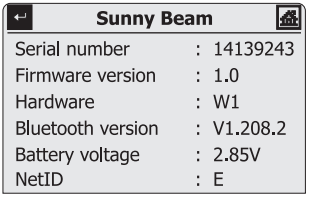
6.10.2 Accessing device information

1. Select "Service > Diagnosis > Device information".
2. Select "Sunny Beam" or one of the inverters.

☑ The information about the selected device is displayed.

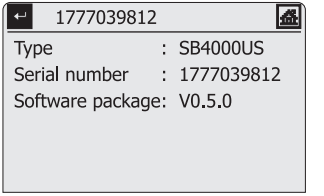
The device information contains the following details:

SUNNY BEAM



- Serial number
- Firmware Version
- Hardware
- Bluetooth version
- Battery voltage
- NetID

Inverter



- Type
- Serial number
- Software package of the inverter

6.10.3 Performing an update

When the Sunny Beam is updated, all the settings and data will be saved.

To perform an update, you will need:

- A computer with an Internet connection, in order to download the update file from the Internet. Supported computer operating systems, see section 7.1 "System requirements" (page 65).
- Supplied USB connection cable

1. Download the update file, which can be found in the download area of www.SMA-America.com.

   Do not rename the update file, or the Sunny Beam will not recognize the file.
2. Select "Service > Update" in the Sunny Beam main menu.
3. Connect the Sunny Beam to the computer with the supplied USB connection cable.

   ☑ Sunny Beam will sign on to the computer as an inverter. Two drives are added to the computer. One drive contains the folder "UPDATE".

The Sunny Beam must remain connected to the computer until the update is completed!

Do not unplug the USB connection cable from the Sunny Beam and do not switch the computer off until the update is complete. If you do so, the Sunny Beam will not be able to perform the update.

4. Copy the update file to the folder "UPDATE". The existing file can be overwritten.
5. Select "OK" on the Sunny Beam.

   ☑ The menu "Update" is displayed.
6. Remove the Sunny Beam using the icon "Safely Remove Hardware" in the taskbar on the computer, as the update cannot be performed correctly otherwise. The icon "Safely Remove Hardware" as displayed in the operating system Windows XP is depicted on the right.

   The Sunny Beam must remain connected to the computer via the USB connection cable.
7. To start the update, confirm the request by pressing "Yes".

   ☑ The update starts.

   As soon as the update is completed, a message is displayed.
8. Select ">>".

☑ The first chart for the complete PV system, "Power today", is displayed.

9. Unplug the USB connection cable from the computer and the Sunny Beam.

☑ The update is complete.

6.10.4 Resetting the Sunny Beam

Resetting the Sunny Beam will restore the factory settings of the Sunny Beam.

All system data, CSV files and settings on the Sunny Beam are erased when it is reset!

If required, save the CSV files on your computer, as described in section 7.2 "Copying system data to the computer" (page 65). After the Sunny Beam is reset, you need to commission it again.

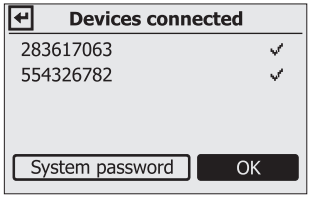
1. Select "Service > Reset".
2. To perform the reset, confirm the request with "Yes".

   ☑ The Sunny Beam performs the reset. This may take a few minutes. When the reset is complete, the Sunny Beam switches itself off.

☑ The reset is complete.

6.11 System settings

6.11.1 Calling up the list of connected devices



You can call up a list of all inverters which are connected to the Sunny Beam.

1. Select "Settings > PV plant > Devices connected".

☑ The list of connected devices appears.

Inverters for which the correct system password has been entered in the Sunny Beam are marked with a check mark (✓).

Inverters for which an incorrect system password has been entered are marked with a padlock (🔒).

Padlock symbol for inverters with SMA Bluetooth Piggy-Back

For inverters with SMA *Bluetooth* Piggy-Back, the padlock symbol is displayed when the inverter switches off at night. Since the Sunny Beam cannot establish a connection to this inverter, it interprets this as an incorrectly entered password.

For inverters with SMA *Bluetooth* Piggy-Back the padlock will disappear once the inverter has switched itself on in the morning, and the password has been entered correctly.

6.11.2 Entering the system password

If you have modified the system password of the inverter with Sunny Explorer after commissioning the Sunny Beam, you can enter the new system password in the Sunny Beam without having to commission it again.

Proceed as follows:

1. Select "Settings > PV plant > Devices connected".

☑ The list of devices that are connected to Sunny Beam is displayed.

2. Perform the steps from the section "Enter the new system password in the Sunny Beam" (page 31).

6.11.3 Repeating the system search

If you repeat the system search, your system data, CSV files and settings will be kept on the Sunny Beam. Data from inverters that have been added to the PV plant will be retrieved from the day before yesterday onwards and saved on the Sunny Beam.

Reset before a system change

If you wish to detect a different PV plant with the Sunny Beam, you need to reset the Sunny Beam first. This will erase the data from the previously detected PV plant.

No search for *Bluetooth* PV plants with NetID 1

The Sunny Beam cannot search for *Bluetooth* PV plants with the NetID 1. Only NetIDs from 2 to 9 and from A to F are possible.

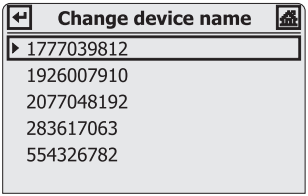
1. Select "Settings > PV plant > New plant search".
2. Select "Start detection" to start the system search.
   ☑ The system search will begin.

If	Then
A free NetID is already set on the devices of your *Bluetooth* PV plant.	Perform the steps from the section "Determining a free NetID" (page 24).
No free NetID has been set on the devices in your *Bluetooth* PV plant.	Perform the steps from the section "Search for your own Bluetooth PV plant" (page 27).

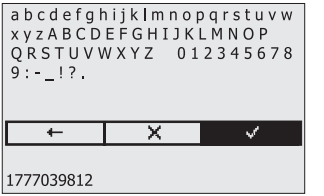
6.11.4 Changing the device name

The device names of the detected inverters are displayed as serial numbers on the Sunny Beam. You can change the serial numbers to a descriptive device name in order to better distinguish between the inverters on the Sunny Beam. The names you give the devices are only shown on the Sunny Beam and will not be transferred to the inverters or displayed on any other communication device (e.g. Sunny Explorer).

1. Select "Settings > PV plant > Change device name".
   ☑ The list of devices that the Sunny Beam manages is displayed.
2. Select the serial number or a previously assigned device name.



☑ The input page appears.



←	Arrow: deletes the character which was entered last.
✕	Cross: cancels the input action.
✓	Check mark: the entered device name is saved.

3. Delete the serial number or previously assigned device name using the arrow.
4. Enter a new device name using the characters.
5. To save the device name, select the check mark.

☑ The device name has been changed.

6.11.5 Adjusting the energy meter when switching devices

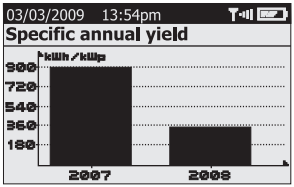
1. Select "Settings > PV plant > Offset energy meter".
2. Select the new inverter.
3. Set the revenue of the previous inverter.

☑ The energy meter has been adjusted.

6.11.6 Setting the maximum plant power in kWp

The plant power in kWp (kilowatt peak) is the maximum possible performance of the PV plant and serves to compare PV plants of different sizes with one another. You can find out the value in kWp from your installer.

The Sunny Beam requires the plant power in kWp to calculate the specific annual yield (kWh/kWp). The specific annual yield is one of the charts displayed by the Sunny Beam, depicted to the right.



The Sunny Beam can display the plant performance for the last 20 years. The more years are included, the more narrow the columns will be.

Calculating the specific annual yield with the Sunny Beam.

The Sunny Beam calculates the specific annual yield as follows:

- kWh (kilowatt hour) divided by kWp (kilowatt peak)

The Sunny Beam calculates the value for kWh per year by adding the daily power (E-Day) from the first to the last day of the year:

- E-Day1 + E-Day2 + E-Day3 + all E-Day values until 31 December of the year

The data from January to December is required

The specific annual yield is only representative if data from the whole year is used. If, for instance, your PV plant has been commisioned with the Sunny Beam in July, there is no data from the previous months.

1. Select "Settings > PV plant > Plant Power in kWp".
2. Set the plant power in kWp.

☑ The plant power in kWp has been set.

When expanding your *Bluetooth* PV plant

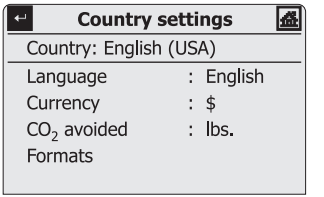
If your *Bluetooth* PV plant is to be expanded with more PV modules, you need to set the new plant power in kWp on the Sunny Beam. The new inverters can be added to the Sunny Beam by performing a new system search (see section 6.11.3 "Repeating the system search" (page 57)).

6.12 Country settings

In the menu "Settings > Country settings", you can make country-specific settings.

If you change the country, the settings in the menu items below the line will automatically be adjusted to the selected country. In addition, you can change the settings manually.

- Country
  - Language
  - Currency
  - CO_2 avoided
  - Formats
    - Decimal separator
    - Date format
    - Timestamp format



6.12.1 Changing the language

1. Select "Settings > Country settings > Country".
2. Set the language.

☑ The language has been changed.

6.12.2 Changing the currency

1. Select "Settings > Country settings > Currency".
2. Set the currency.

☑ The currency has been changed.

6.12.3 Changing the unit of CO_2 avoided

1. Select "Settings > Country settings > CO_2 avoided".
2. Set the unit.

☑ The unit of CO_2 avoided has been changed.

6.12.4 Changing the Decimal Separator

1. Select "Settings > Country settings > Formats".
2. Select "Decimal separator:" and change the setting.

☑ The decimal separator has been changed.

The decimal separator in the power and energy display (section 6.4) on the Sunny Beam cannot be changed and will always be a point.

6.12.5 Changing the date format

Abbreviations: D= day, M= month, Y= year

1. Select "Settings > Country settings > Formats".
2. Select "Date format" and change the setting.

☑ The date format has been changed.

6.12.6 Changing the Timestamp Format

Possible settings: 12h or 24h (e.g. 6:00 pm or 18:00)

1. Select "Settings > Country settings > Formats".
2. Select "Timestamp format" and change the setting.

☑ The timestamp format has been changed.

6.13 Changing the date and time

Setting the date and time correctly

Be sure to set the correct values for date, daylight saving time, time and time zone. If you reset the time after commissioning, the data associated with the time difference will be deleted from the inverter. Please note that the time may also be reset if you change the settings for time zone or daylight saving time.

1. Select "Settings > Date & time".
2. Select "Date" or "Time" and change the setting.

☑ The date and time are changed.

6.14 Activating/deactivating daylight saving time

Setting the time zone correctly

Be sure to set the correct values for date, daylight saving time, time and time zone. If you reset the time after commissioning, the data associated with the time difference will be deleted from the inverter. Please note that the time may also be reset if you change the settings for time zone or daylight saving time.

1. Select "Settings > Date & time".

2. Set or remove a checkmark in the box for "Daylight saving time". When there is a checkmark in the box, daylight saving time is activated. The time settings on the Sunny Beam and on the inverters will switch to daylight saving time.

☑ Daylight saving time is activated/deactivated.

6.15 Changing the Time Zone

Setting the time zone correctly

Be sure to set the correct values for date, daylight saving time, time and time zone. If you reset the time after commissioning, the data associated with the time difference will be deleted from the inverter. Please note that the time may also be reset if you change the settings for time zone or daylight saving time.

1. Select "Settings > Date & time".
2. Select "Time zone" and change the setting.

☑ The time zone is changed.

7 Managing System Data

At the end of each day, the Sunny Beam saves the new total energy yield (E-Total) that the PV plant has produced. The Sunny Beam saves the total energy yield for the complete PV plant and for each inverter. In addition, a 10-minute average is calculated.

A CSV file is stored for each day. No monthly or annual files are generated. For inverters with integrated SMA *Bluetooth* Piggy-Back, it can take as long as until noon the next day, before the Sunny Beam can save the CSV files.

The Sunny Beam saves the total energy yield for at least 100 days. The storage volume depends on the number of inverters. If the memory of the Sunny Beam is full, the oldest data is overwritten. How to copy the PV plant data from the Sunny Beam to your computer is described in Chapter 7.2 "Copying system data to the computer" (page 65).

Values for daily yield (E-Today) and Power

With a spreadsheet, for example Microsoft® Excel, you can calculate the values for daily yield and power using the total energy yield (E-Total), which is saved by the Sunny Beam, with Excel for example.

7.1 System requirements

Supported operating systems for connecting the Sunny Beam to the computer:

- Windows® XP, Windows Vista
- Linux (SUSE, RedHat, Ubuntu, Debian etc.) with support for USB and mass storage devices
- Mac OS® X, 10.3 and later
- Mac OS® classic, 8.6 and later with support for USB

7.2 Copying system data to the computer

The Sunny Beam signs on to the computer as an inverter. This means that you can copy the plant data onto the computer in the same way as with a USB memory stick.

To copy the system data to the computer, proceed as follows:

1. Connect the Sunny Beam to the computer with the supplied USB connection cable.
   ☑ Sunny Beam signs on as an inverter. A drive is added to the computer. The drive contains the folder "SBEAM".
2. Open the "SBEAM" folder and copy the CSV data to the computer.

☑ The system data is now saved on the computer.

7.2.1 CSV format

The CSV files can be opened in Microsoft Excel and used to create charts.

File name

The name of the file is always the date that the data was generated by the inverter. The sequence is always year, month, date. The separator is a hyphen.

YY-MM-DD = Example: 09-07-15.csv

Data format in the file

Individual data is separated by a semicolon in the file. The decimal separator and the timestamp format in the files are determined by the country settings. For information on how to change the decimal separator and the timestamp format, please refer to Chapter 6.12.4 "Changing the Decimal Separator" (page 62) and Chapter 6.12.6 "Changing the Timestamp Format" (page 63).

8 Menu overview

Complete PV plant			
Inverter			
Events			
Device Set-up	Display options	Contrast	Upper contrast Lower contrast
		Display off after	Upper display Lower display
		Balance coefficients	Revenue / kWh CO_2/kWh
	Alarm	Signal every	
	Date & time	Date	
		Daylight saving time	
		Time	
		Time zone	
	Data query	Data query every	
		Live query for	
		Overnight Shutdown	active
	Country settings	Country	
		Language	
		Currency	
		CO_2 avoided	
		Formats	Decimal separator Date format Timestamp format
	PV plant	Connected devices	
		New plant search	
		Change the device name	
		Offset energy meter	
		Plant power in kWp	
Service	Diagnosis	Connection quality	
		Device information	
	Update		
	Reset		

9 Maintenance and Care

9.1 Maintenance

9.1.1 Replacing the batteries

The batteries must be replaced when they no longer charge properly and this adversely affects the operation of the Sunny Beam.

Notice!

Use of an incorrect type of Batteries may cause leakage of battery acid

Possible damage to the Sunny Beam.

You must only use rechargeable nickel-metal hydride batteries (NiMH), type Mignon (AA) with low self-discharge, e.g. Eneloop batteries (see section 13 "Accessories" (page 79)).

Notice!

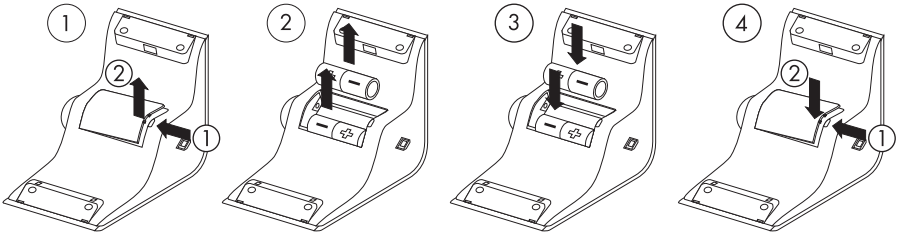
Overcharging of the batteries due to varied states of charge.

Battery acid may leak and can cause damage to the Sunny Beam.

- Always use the batteries in pairs and replace at the same time.

1. Open the battery compartment on the underside of the Sunny Beam.
2. Remove empty batteries from the Sunny Beam as illustrated below.
3. Place the new batteries into the battery compartment of the Sunny Beam according to the indication.

4. Close the lid of the battery compartment.



5. Press the button to switch the Sunny Beam on.

   ☑ The Sunny Beam checks whether an update file has been saved on the Sunny Beam.

If	Then
There is an update file on the Sunny Beam.	The Sunny Beam will perform the update.
There is no update file.	The Sunny Beam will start up.

☑ The chart view for the complete system is displayed. The batteries have been replaced.

Make sure that the time and date settings of the Sunny Beam are correct. If the settings are incorrect, change time and date (Chapter 6.13 "Changing the date and time" (page 63)).

9.2 Care

Notice!

Ingress of water during cleaning may cause damage to the Sunny Beam.

The Sunny Beam is not waterproof.

- Protect the Sunny Beam from wet conditions.

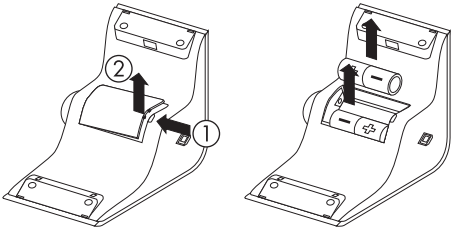
Cleaning the Sunny Beam

To clean the Sunny Beam, only use a lightly dampened cloth to prevent the penetration of moisture. If there is a considerable amount of dirt, you can also use a mild, non-abrasive, non-corrosive cleaning agent.

10 Decommissioning

10.1 Decommissioning the Sunny Beam

1. Open the battery compartment on the underside of the Sunny Beam.
2. Remove empty batteries from the Sunny Beam as illustrated below.
3. Close the lid of the battery compartment.



10.2 Disposing of the Sunny Beam

Dispose of the Sunny Beam at the end of its service life in accordance with the disposal regulations for electronic waste which apply at the installation site at that time. Alternatively, send it back to SMA America with shipping paid by sender, and labeled "FOR DISPOSAL" (the address can be found on page 80).

10.3 Disposing of the batteries

Dispose of the batteries at the end of their service life in accordance with the disposal regulations for batteries which apply at the installation site at that time.

You can order new batteries for the Sunny Beam from SMA America (see Chapter 13 "Accessories" (page 79)).

11 Troubleshooting

Problem	Cause and solution
System search The Sunny Beam does not list the NetID of your *Bluetooth* PV plant.	• Your *Bluetooth* PV plant has no device within the radio range of your Sunny Beam. – Place the Sunny Beam closer to a device of your *Bluetooth* PV plant. If this is not possible, use the SMA *Bluetooth* Repeater to bridge the radio gap.
	• The devices of your *Bluetooth* PV plant are not in operation. – Determine a free NetID, as described in the section "Determining a free NetID" (page 24), and then commission the devices as described in the respective manual.
	• The NetID 0 (*Bluetooth* off) or NetID 1 may have been assigned to the devices. The Sunny Beam cannot detect devices with NetID 1. – Set the free NetIDs of your *Bluetooth* PV plant on the inverters and any available SMA *Bluetooth* Repeaters, as described in the respective manual. If no NetID has been determined for the *Bluetooth* PV plant, determine a free NetID as described in the section "Determining a free NetID" (page 24).

Problem	Cause and solution
Devices not found The Sunny Beam does not list all the inverters of your *Bluetooth* PV plant.	• For PV plant with many devices, it could take a while for all of the devices to become integrated in the Bluetooth network. – Repeat the search.
	• The NetID of your *Bluetooth* PV plant has not been set on the missing inverters. – Check whether the NetID of your *Bluetooth* PV plant has been set on the inverters and SMA *Bluetooth* Repeaters, as described in their respective manuals.
	• Sunny Beam was not able to establish a radio connection to the missing inverters. – Check the connection quality of the inverters and SMA *Bluetooth* Repeaters, as described in their respective manuals. The connection quality of each device must be at least good.
The Sunny Beam lists your inverters as well as inverters from other plants.	• There is another *Bluetooth* PV plant within the radio range of the Sunny Beam, which uses the same NetID as your *Bluetooth* PV plant. – By determining a free NetID this should not occur. Determine a free NetID again, as described in the section "Determining a free NetID" (page 24).
Radio connection The radio connection to the Sunny Beam is unreliable.	• The Sunny Beam is too far away from your *Bluetooth* PV plant, or the radio connection between the Sunny Beam and your *Bluetooth* PV plant is subject to interference. Reasons for the interference could be, for example, walls or ceilings which weaken the radio waves. – Place the Sunny Beam closer to a device of your *Bluetooth* PV plant. If this is not possible, use the SMA *Bluetooth* Repeater to bridge the radio gap.

Problem	Cause and solution
Connection to the computer The computer displays a message that the USB device can perform better.	• The message does not affect the functionality or speed of the Sunny Beam. – You can switch the message off, but then other USB error messages will not be displayed. Proceed as follows. These steps describe Windows XP and may be different in other operating systems. Right-click on "My Computer" and select "Device Manager". Open the "USB Controller" in the Device Manager. Right-click on the item "Host Controller". Select "Properties". Select "Advanced". Tick the box that says "Do not display USB errors".
Chart view Gaps or extreme characteristics in the chart data.	• There will be gaps displayed in the charts if you changed the time setting of the Sunny Beam forwards after the PV plant has been detected by the Sunny Beam. Extreme characteristics will appear, if you have set the time backward. The reason for this is that an inverter saves the generated data together with the current time. The Sunny Beam will retrieve the data from the inverter and display them. – Do not change the time settings on the Sunny Beam more often than necessary.
Padlock symbol ( ) The padlock symbol is displayed, although the correct system password was entered.	• For inverters the padlock symbol is displayed when the inverter switches off at night. Since the Sunny Beam cannot establish a connection to this inverter, it interprets this as an incorrectly entered password. – As soon as the inverter is switched on in the morning, the padlock will disappear.

Problem	Cause and solution
Time The time settings were not saved.	• Due to the extensive time management in your PV plant, the first attempt to change the time settings may not be successful, if, for example, the time has already been set using Sunny Explorer. – Check the time settings again after commissioning and correct them, if required.

You can download additional information about SMA *Bluetooth* Wireless Technology from the download area at www.SMA-America.com.

12 Technical Data

Communication	
Inverter communication	*Bluetooth*
Computer communication	USB 2.0
Connections	
USB	
Max. number of devices	
Bluetooth	12
Max. communication range	
Bluetooth (outdoors)	up to 330 ft.
Power supply	
Power supply	integrated solar cell, USB connection cable, USB plug-in power supply
Number of batteries	2
Type of battery	Rechargeable nickel-metal hydride batteries (NiMH), type Mignon (AA), 1.2 V DC with low self-discharge, e.g. Eneloop.

Environmental conditions during operation	
Ambient temperature	32 °F to +104 °F
Protection rating	NEMA 1 (IP20)
General data	
Dimensions (W /H /D) in inches	5/2.95/7.67 (as tabletop device)
Weight	approx. 12 oz. (with batteries)
Mounting location	indoors
Status display	LCD
Software language	German,, English, Spanish, French, Italian, Dutch, Portuguese, Czech
Features	
Display	LCD
Operation	Rotary Pushbutton
Warranty	5 years
Certificates and permits	www.SMA-America.com
Information displayed	
General information	Time, date
System data	Current power, power today and power yesterday, total yield, daily yield, yield yesterday, yield of the last 31 days and the last 12 months and annual yield, revenue today and total revenue, CO_2 avoided today and total, warnings, faults
Accessories	
USB plug-in power supply	
Replacement batteries	

12.1 FCC Compliance Information

SMA system monitoring unit, model SMA *Sunny Beam Bluetooth*®.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions:

1) This device may not cause harmful interference, and

(2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.
- The user is cautioned that changes or modifications not expressly approved by SMA America,

Inc. could void the user's authority to operate this equipment.

Contact SMA America for more information.

RF-exposure Statement

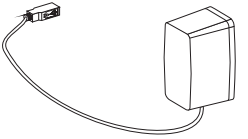
The SMA *Sunny Beam Bluetooth* contains a modular transmitter. Thus it must have a separation of at least 7.87 in. between the antenna and the body of the user or nearby persons, excluding hands, wrists, feet, and ankles.

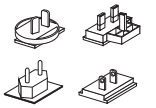
13 Accessories

13.1 USB plug-in power supply

The USB plug-in power supply can be used to connect the Sunny Beam to a socket, to charge the batteries via the mains instead of using the solar cell.

Order number: BEAM-BT-SUPPLY

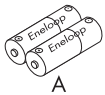

A


B

Position	Quantity	Name
A	1	USB plug-in power supply
B	4	Adapter

13.2 Replacement batteries

Order number: BEAM-BT-BATTERY



A

Position	Quantity	Name
A	2	Eneloop rechargeable batteries

14 Contact

If you have technical problems concerning our products, contact the SMA Serviceline. We need the following information in order to provide you with the necessary assistance:

- Sunny Beam hardware (see section 6.10.2)
- Sunny Beam firmware version with *Bluetooth* (see section 6.10.2)
- Firmware version of the SMA *Bluetooth* Piggy-Back in the inverter (see SMA *Bluetooth* Piggy-Back manual)
- Inverter type and serial number (see inverter manual)

SMA America, Incorporated

4031 Alvis Court

Rocklin, CA 95677

Tel. +1 916 625 0870

Fax +1 916 625 0871

Service@SMA-America.com

www.SMA-America.com

SMA America, Incorporated

www.sma-america.com